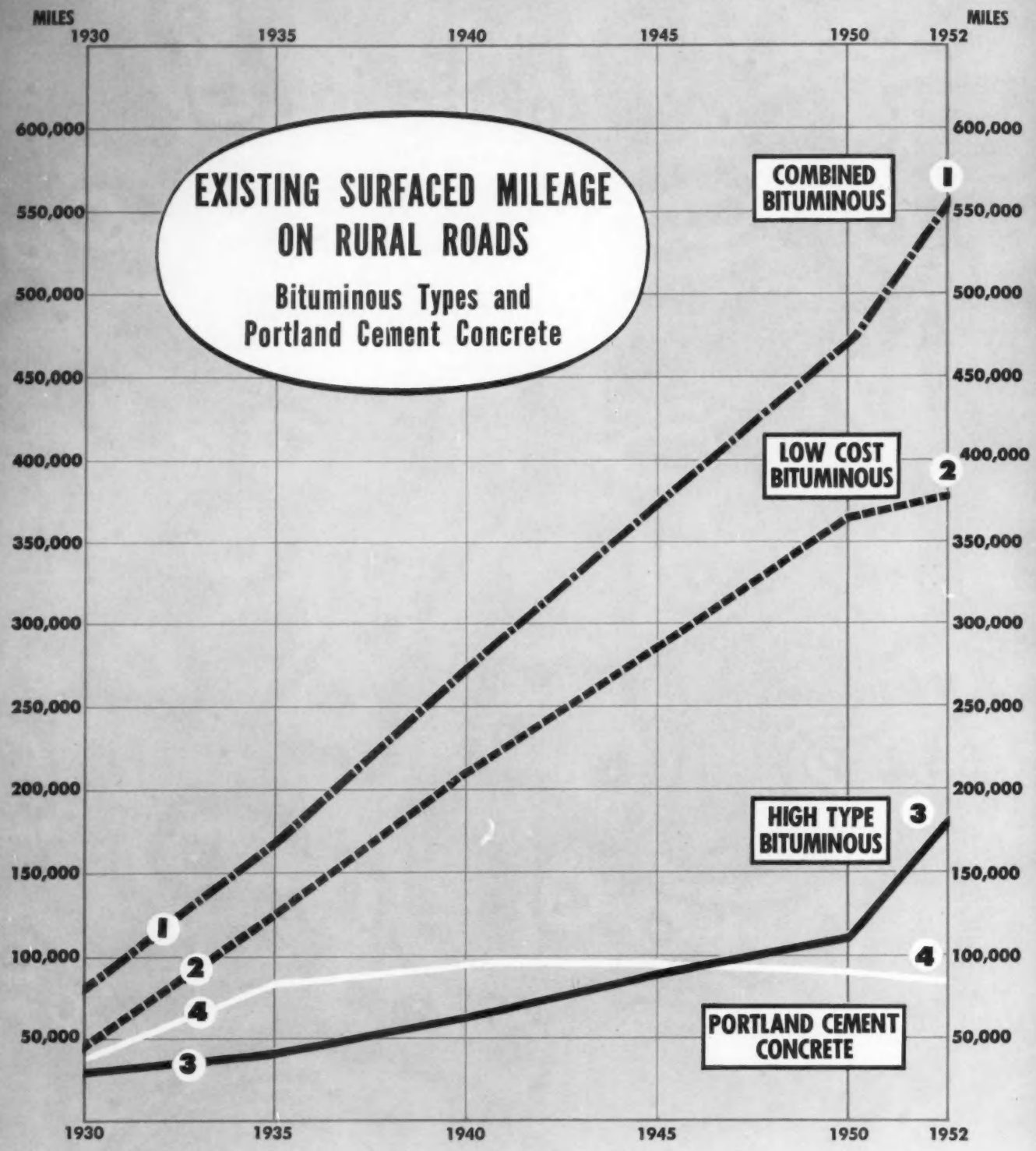
Asphalt Institute Quarterly

JANUARY 1954



This chart shows at a glance that Bituminous Types of paving are now used on Rural Roads in the United States to the extent of well over half a million miles, following steady, very large gains since 1930.

It shows too, that Portland Cement Concrete mileage has changed little in totals in this period, its newly-built mileage having been consistently offset by mileage resurfaced with Asphalt.

SOURCES: U. S. Bureau of Public Roads for *all* rural roads — 1950 and 1952. American Association of State Highway Officials for rural roads on state systems — 1930, 1935, 1940 and 1945.

CHARTED BY THE ASPHALT INSTITUTE, JANUARY 1954

ASPHALT INSTITUTE Quarterly

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The names of the Member Companies of the Institute, who have made possible the publication of this magazine, are listed herein on page 15.

EDITORS

Bernard E. Gray, *President of The Asphalt Institute*
Ernest M. Bristol, *Director of Public Relations*

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COVERS

The double covers picture shows a section of Long Island's beautiful Northern State Parkway, one of the important arteries of the parkway system surrounding New York City. Originally constructed of portland cement concrete, a 6½ mile pavement section has recently been resurfaced with 2½" of Asphalt. A detailed account of the work will be found on page 12.

Photo: Ewing Galloway

The cumulative chart on page 2, quite significantly, shows High-Type Bituminous mileage growing most rapidly in the latest years reported. The increase in such existing total from 107,476 in 1950 to 182,702 in 1952 represents a net increase in two years of over 75,000 miles.

EDITORIAL

How long should a pavement last? When asked how long a man's legs should be, Abraham Lincoln replied with his unerring logic: "Long enough to reach the ground." So it is with street and highway pavements — they should function adequately to serve traffic needs.

It is a fundamental principle that business should expand out of earnings, and the highway phase of transportation is no exception. In the early days of railroad building it was practical economy to aim first to connect important terminals as soon as possible, even though it was apparent that the initial location was not the best obtainable. Only as the enterprise proved profitable were improvements made in alignment and grade. This was the practice for several generations of national growth.

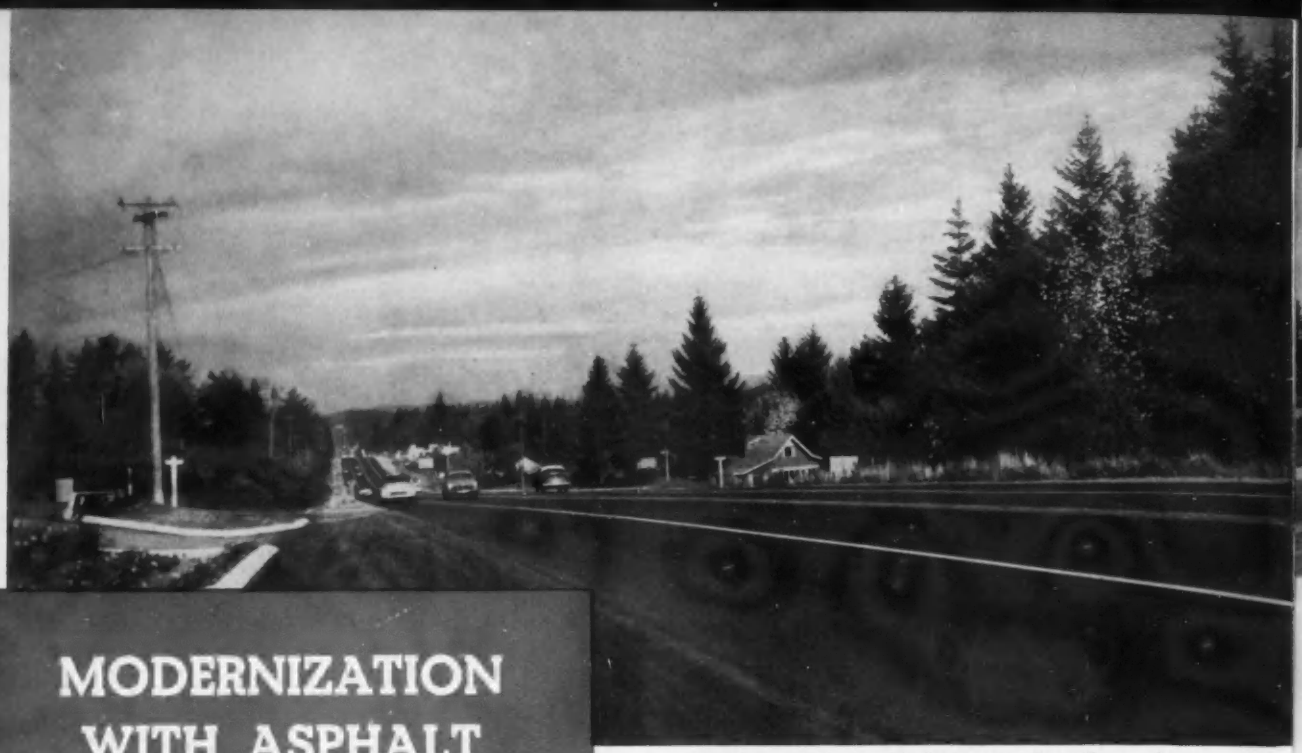
Similarly, highways have been undergoing relocation and change for some time. Thirty years ago it was most important to connect county seats, principal cities, and states with one another. As the most desirable location then could not be determined in all instances, both prudence and limited funds actually called for a pavement equal only to the traffic demands of a relatively short period. Unfortunately this was not always the practice, and several thousand miles of costly pavement were placed on crooked and steep alignments which practically necessitated their retention in use long after relocation would have been desirable. With sound economic reasoning, the greater part of this early mileage, however, was built with less expensive surfacing which, if subsequent developments proved the location sound, could be completely salvaged through resurfacing. If realignment did prove to be the economical procedure, no great amount of investment in pavement had to be abandoned.

One important item frequently overlooked by present critics of the early highway development is the *steadily lowered cost of earthwork.* Notwithstanding the increase in price of almost everything else, it is much cheaper to move a cubic yard of earth in 1954 than it was in 1924, in most parts of the country. Thus, to have attempted to build all the roads straight and level thirty years ago, to the extent now desirable for modern traffic on a limited mileage, would have been to tie up money needlessly long before such degree of improvement was necessary.

In appraising the useful life of a pavement, therefore, it is necessary to total the first cost, the interest cost on the investment, and the maintenance cost. Highways today are approaching stability in final location and in the majority of cases present alignments are largely satisfactory, provided old existing pavements are strengthened, widened, and resurfaced with asphalt.

Asphalt lends itself to this kind of maintenance and modernization better than any other material, because the smooth-riding qualities can be restored with a minimum new thickness and at a minimum cost. Resurfacing can be applied to other types of pavement but there is required much greater thickness, whether of the same material or of asphalt, at much greater cost.

As highway location becomes fixed, therefore, adoption of methods which will permit restoration of proper surface characteristics with minimum interference with traffic becomes of paramount importance. Replacement of the full depth of pavement with attendant barricades and one-way traffic becomes an intolerable condition. Maintenance methods must be ones that will repair the pavement quickly and efficiently, and which will also at times contribute to the increased strength required where weight and volume of traffic have increased.



MODERNIZATION WITH ASPHALT IN THE NORTHWEST

By Rodney P. Ryker

District Engineer, The Asphalt Institute

Section of U. S. 99 between Seattle and Everett after undersealing and complete resurfacing with asphalt.

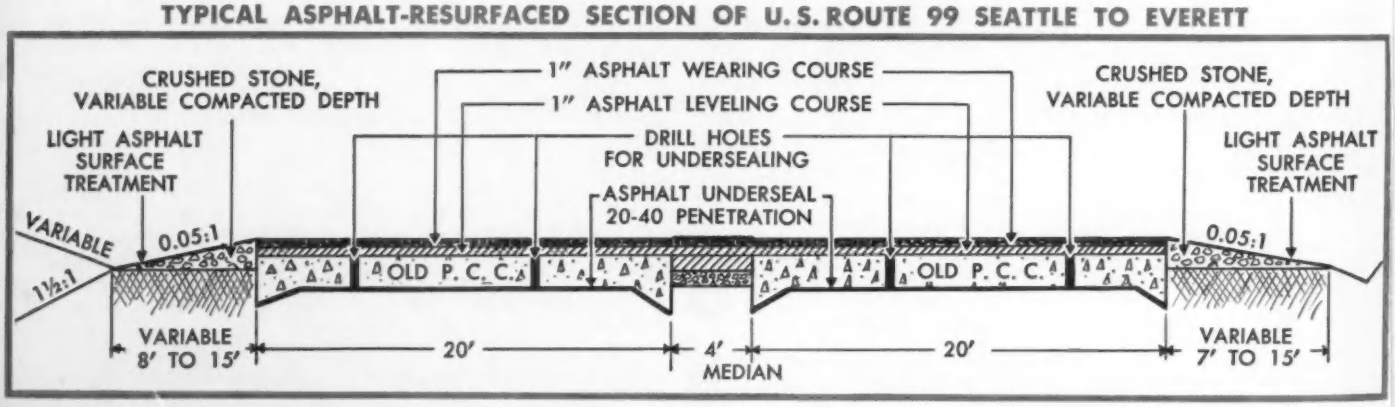
Stretching north from Seattle toward the Canadian border on U. S. Route 99 is one of the busiest highways in the State of Washington. Traffic counts on this road now show an average of 19,000 vehicles a day, with rate of growth indicating 22,000 by 1960. The twenty miles of highway from Seattle to the industrialized lumber capital of Everett bear the brunt of this traffic, for over this section drive not only heavy trucks, carrying the lumber, agricultural and dairy products of the rich Skagit Valley, but also the cars of thousands of tourists heading for the Mt. Baker recreational areas, Puget Sound resorts, and the Dominion of Canada.

EARLY CONSTRUCTION

As long ago as 1920, highway engineers foresaw the great industrial and agricultural development of northwestern Washington and planned the construction of one of the first four-lane superhighways in the State. Initial operations involved widening to four lanes and resurfacing with Asphalt Hot-Mix the old two-lane brick highway which extended north from Seattle for 3½ miles. A new location was surveyed for the remaining 18 miles to Everett. This latter section, constructed of portland cement concrete between 1927 and 1931, consisted of two twenty-foot lanes divided by a four-foot median strip.

The first resurfacing work was done in 1947, when 1½ miles of the portland cement concrete road running north from the Seattle city limits were renewed with Asphalt Hot-Mix. Two years later another 3.4 miles were resurfaced, with additional Asphalt laid in subsequent years on certain other rough sections.

TYPICAL ASPHALT-RESURFACED SECTION OF U. S. ROUTE 99 SEATTLE TO EVERETT



Former portland cement concrete pavement, same view as at left. Both foundation and surface called for asphalt modernization.

Resurfacing in progress. No detours were necessary during these operations.

Photos: Ryker

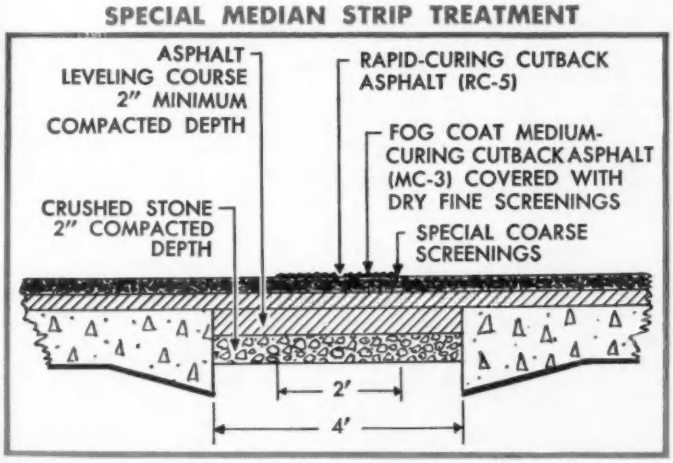
UNDERSEALING AND RESURFACING OPERATIONS

With the old concrete pavement continuing to show signs of distress, highway engineers, in the Spring of 1953, decided that the remaining sections of the highway to Everett should be rehabilitated, and bids were called for resurfacing 10.11 miles of pavement on which no Asphalt had yet been placed. A joint contract was awarded to the Western Asphalt Company and the Seattle and Associated Sand and Gravel Company of Everett.

Plans called for a leveling and a wearing course each consisting of Asphalt Hot-Mix compacted to a minimum thickness of 1". The 23,740 tons of mix used for the former and 16,775 tons for the latter made this resurfacing the largest Asphalt paving project ever to be contracted by the State of Washington.

Movement and pumping of the old concrete slabs made it necessary first, before starting to resurface, to stabilize them by undersealing the original pavement with a special heavy grade of Asphalt, a method which has been proven extremely effective. The engineers' estimate provided for drilling approximately 13,000 holes through which 504 tons of 20-40 penetration asphalt would be pumped. So bad was the condition of the concrete, however, that the actual amount of Asphalt required was nearly twice the estimate — a total of 980.7 tons, or an average of over 18 gallons per hole for the 12,474 holes actually drilled.

SPECIAL MEDIAN STRIP TREATMENT


ASPHALT LEVELING COURSE 2" MINIMUM COMPACTED DEPTH
RAPID-CURING CUTBACK ASPHALT (RC-5)
FOG COAT MEDIUM-CURING CUTBACK ASPHALT (MC-3) COVERED WITH DRY FINE SCREENINGS
CRUSHED STONE 2" COMPACTED DEPTH
SPECIAL COARSE SCREENINGS
2'
4'

SPECIAL MEDIAN STRIP TREATMENT

Another feature of this project was the application of a special median strip treatment. A light fog coat of medium-curing cutback asphalt (MC-3), two feet in width, was applied at a rate of not more than 0.15 gallon per square yard and immediately covered with dry fine screenings. Following this prime coat, a rapid-curing cutback asphalt (RC-5) was applied at a rate of approximately 0.25 gallon per square yard and covered with crushed white crystaline dolomite at a rate of 36 pounds per square yard. The grading of the special coverstone was 7/8" maximum size with not more than 3% passing No. 10 sieve. This course-graded aggregate produces a perceptible tire rumble, warning the drivers of vehicles traveling the inside lanes that they are encroaching too far to the left on the median strip.

TRAFFIC EASILY HANDLED

Disruption of the smooth flow of traffic due to road repair work and improvement has long been a major source of annoyance to the motorist, especially on heavily traveled and normally high-speed thoroughfares. One of the outstanding advantages of subsealing and resurfacing with Asphalt is that the road need not be closed nor traffic detoured during working operations. The Seattle-to-Everett project provides an excellent example of how efficiently traffic can be handled in such circumstances.

During subsealing operations traffic on one side of the median strip was confined to a single lane while the crew worked on the other lane. Traffic moving in the other direction had full use of two lanes, with all four lanes open in both directions during non-working hours.

Traffic was also handled practically without interruption during resurfacing operations. It was sometimes necessary to close off two lanes heading in one direction with both north and southbound traffic using the other two lanes. At all times while work was in progress flagmen directed traffic and kept it moving so that motorists experienced only the slightest delay and inconvenience.

Through the use of Asphalt in undersealing the old portland cement concrete pavement slabs to eliminate movement, and resurfacing entirely with Asphalt Hot-Mix, drivers are now enjoying a smooth, safe, quiet ride between two rapidly-growing Washington cities. The Washington State Highway Department's policy of salvaging existing highway facilities is but another example of how highway dollars go further with Asphalt.

ASPHALT "SURROUNDS" WORN CONCRETE IN TEXAS

By Hugh A. Wallace
Division Engineer, The Asphalt Institute

Texas, East of Waco — Sheet Asphalt resurfacing course in use. Second and third Hot-Mix Asphalt courses and flexible base shoulders are still to be placed.

General view of undersealing operation.

Worn concrete, undersealed and widened.

Below, on *both sides,* and *above,* Texas is using Asphalt to modernize by undersealing, widening, and resurfacing the portland cement concrete State Highways Nos. 6 and 164, east of Waco in McLennan County. On May 19, 1953, the Texas Highway Department awarded a contract to Cage Bros. of San Antonio for undersealing and asphaltic concrete widening and resurfacing of 21.315 miles of these highways.

UNDERSEALING

The first work performed on this contract was the undersealing of the existing 9″-6″-9″ x 20′ rigid pavement. This part of the work was sub-contracted to W. V. Wright of Dallas who has had many years of experience in undersealing work. The square yards of portland cement concrete to be undersealed amounted to 198,957 and was estimated to receive 2.5 gallons of asphaltic undersealing material per square yard. The undersealing was started on June 16 and completed July 22, actual working time being 31 days. The actual amount of material placed was 459,180 gallons.

As most of the existing portland cement concrete had become badly cracked, it was believed that the old pavement should be properly prepared for resurfacing. Undersealing was considered the most effective and economical procedure. The contractor's bid price on this work was 13¢ per gallon for the high-melting-point asphalt and 10¢ each for drilling an estimated 29,201 holes. The asphalt used for this work conformed to the Texas Highway Department's specifications for OA-30 asphalt which corresponds to Federal specifications SSA-666, Type II, Grade 2, steep roofing asphalt.

WIDENING AND RESURFACING

Immediately upon the completion of the undersealing the general contractor started widening operations which involved placing a 9″ asphalt binder course 2′6″ to 3′ wide on each side of the existing pavement. This binder course was placed in three 3″ layers, as shown in typical cross section below.

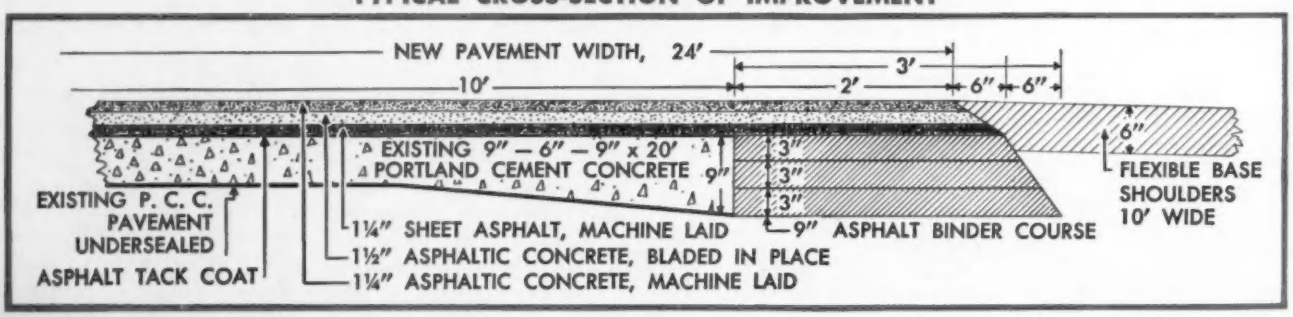
Placing first resurfacing course (Sheet Asphalt) over undersealed and widened concrete.

Upon the completion of widening operations, one course of 125 pounds per square yard of Texas Type E surface course (sheet asphalt) was placed throughout the entire length of the project. Traffic is being allowed to use this first course for as long a period as possible prior to placing the second course so as to force sufficient mixture into cracks, joints and spalled areas.

The second course will consist of 150 pounds of Texas Type C asphalt mix per square yard. This mix uses ¾″ maximum size aggregate and, as its function is primarily a leveling course, is spread with motor graders rather than the usual mechanical finishing machine.

The third, or wearing course, is to be a Texas Highway Department Type D asphalt mix, 125 pounds per square yard, which specifies a ½″ maximum size aggregate. This course is placed with a mechanical spreader.

TYPICAL CROSS-SECTION OF IMPROVEMENT



The asphalt pavement on U. S. 40, west of Columbus, as it appeared in 1922. Road was then 16 ft. wide.
Photo: U. S. Bureau of Public Roads

Today this 5.3-mile section is an all-asphalt dual - lane superhighway, 48 feet wide. To the right of the median strip is the "old" asphalt road, now 40 years old.
Photo: Herb Topy Photo Service

STAGE CONSTRUCTION ON U. S. 40, OHIO

By John H. Goshorn

Division Engineer, The Asphalt Institute

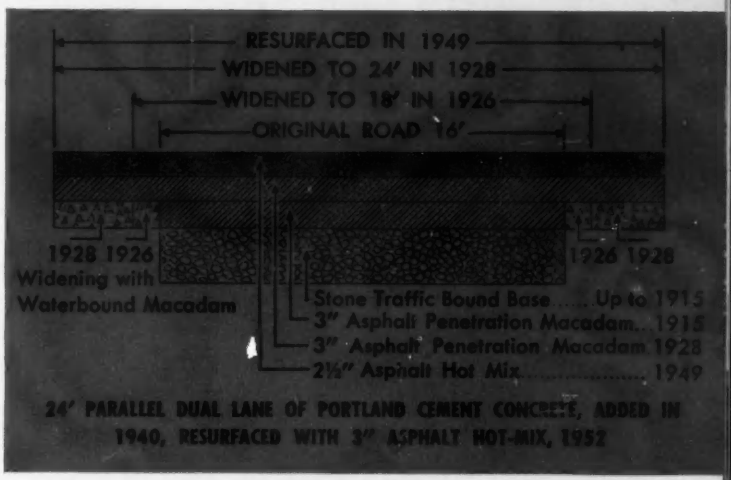
In several past issues the Asphalt Institute Quarterly has featured articles on "old" asphalt roads — roads built thirty to forty or more years ago which are still in top service condition. It is believed that these roads with their unlimited pavement-life merit the appreciation of all taxpayers. Their construction most successfully demonstrates the fact that well built, well maintained asphalt pavements do not wear out. Nearly every State has "old" asphalt roads, built many decades ago, which are now at their best — wider, stronger, smoother — and it is their impressive service record, recognized nationally, which has led to the greatly increased use of asphalt on heavy-duty highways.

THE ECONOMY OF STAGE IMPROVEMENT

The 5.3-mile section of U. S. Route 40 west of Columbus, Ohio, is but another example of a road which, over a long period of years, has been gradually improved through maintenance and stage construction. Forty years ago this was a stone, traffic-bound surface on a part of one of the country's major highway routes. When in 1915 it became necessary to surface this road, a three-inch asphalt penetration macadam course was placed over the traffic-bound base.

The next two stages of construction involved widening with waterbound macadam to 18 feet in 1926 and then to 24 feet in 1928. In the latter operation the entire pavement was surfaced with an additional 3″ of asphalt penetration macadam.

This construction work was not only sufficient to bear the traffic loads of that time but also improved the road so greatly that for the next twenty-one years it carried steadily increasing weights, requiring only minor maintenance. By


RESURFACED IN 1949
WIDENED TO 24′ IN 1928
WIDENED TO 18′ IN 1926
ORIGINAL ROAD 16′
1928 1926
Widening with
Waterbound Macadam
1926 1928
Stone Traffic Bound Base ..... Up to 1915
3″ Asphalt Penetration Macadam... 1915
3″ Asphalt Penetration Macadam 1928
2½″ Asphalt Hot Mix 1949

24′ PARALLEL DUAL LANE OF PORTLAND CEMENT CONCRETE, ADDED IN 1940, RESURFACED WITH 3″ ASPHALT HOT-MIX, 1952

1940, however, the vehicles using this section of U. S. 40 had become so great in number that an additional 24-foot dual lane was required to handle them all. Constructed of portland cement concrete, this latter pavement in just nine years began to require such extensive maintenance, including slab replacements and undersealing, that in 1952 it was completely resurfaced with approximately 3″ of Asphalt Hot-Mix. With this resurfaced section added, Ohio thus provided a heavy-duty dual highway increased in width from an original 16 feet to 48 feet, all asphalt-paved.

The old asphalt section was surfaced with a leveling course and 2½″ of Asphalt Hot-Mix in 1949. Since then this pavement has required no maintenance and is in excellent condition. Traffic has averaged well above 10,000 vehicles per day, including over 2,000 heavy trucks.

During this 40-year period from 1914 to date the cost of construction and maintenance on the old asphalt section *has totalled* only $3.98 per square yard. At no time has the pavement been inadequate, each element functioning as an integrated part of a load-carrying structure capable of bearing the increasing traffic of today and of years to come.

Equinox Sky Line Drive ASPHALT PAVED

By Edward M. Howard
District Engineer, The Asphalt Institute

The asphalt-paved Drive, completed in August, 1953, begins at the Toll House and climbs to the beautiful Sky Line Inn at the summit of Mt. Equinox.

In the Green Mountain State of Vermont one of the outstanding attractions for motorists during recent years has been the drive to the top of Mount Equinox where, from an elevation of nearly 4,000 feet, four States — Vermont, New Hampshire, Massachusetts and New York — are visible, spread out in magnificent panoramic succession. On a clear day even Mt. Royal in Montreal can be seen. Here, too, on the summit, the most unique and attractive "Sky Line Inn" awaits the visitor.

Since 1947 it has been possible to turn off U. S. Route 7, south of Manchester, and make this mountain ascent entirely by automobile, for in that year a miniature, privately-owned graded Toll Road — The Equinox Sky Line Drive — 5½ miles in length and climbing all the way to the summit, was opened to the public. To make the trip even more pleasurable, Dr. J. G. Davidson, owner of the Drive, last Spring ordered the road paved with Asphalt Hot-Mix, and on August 21, 1953, this construction was completed.

At various times in the past hundred years or more, wagon roads and foot trails were built which skirted Equinox Mountain or ascended part way up its slopes, but these have long been in disuse. In 1939 Dr. Davidson purchased a large tract of land on the mountain, established a residence nearby and, having made many trips by foot up the mountainside, became interested in the project of building a road for motor vehicles so that the public might enjoy, as he did, the unparalleled views from the summit. The first section of this road, up to Little Equinox (elevation 3,320 feet), was constructed in 1941. Following work suspension during World War II, grading operations on the upper section were

begun again in 1947 and finished that summer. The beautiful Sky Line Inn, construction of which was started in 1949, is open during the summer months, affording the visitor the finest in food and drink as well as lodging for the night.

In the 5½ miles from toll house to summit, the Equinox Sky Line Drive climbs approximately 3,200 feet yet, despite this great rise, the average grade of the road is actually less than 10%. In only one or two places does the grade reach 14%. Along the way, there are four parking areas where the motorist may stop to picnic or just to enjoy the view.

ASPHALT PAVING PROCEDURE

For paving the Drive with Asphalt Hot-Mix last summer, Frank W. Whitcomb, Inc., of Bellows Falls, Vermont, was awarded the overall contract, with W. H. Hinman Company of North Anson, Maine, doing the paving on a sub-contract basis. On U. S. Route 7, about one mile south of the toll gate, a suitable natural gravel deposit was located and a crushing plant installed, with a Hot-Mix Asphalt plant established nearby. After a number of trial mixes had been investigated, a final mix was established using the Marshall Method of design. The mix criteria specified a minimum stability of 1,500, with a minimum flow value of 9, and 80% of the voids filled with asphalt. The mix required 5.75% of 85-100 penetration asphalt cement. The gradation of the crushed gravel was 100% passing a ½" sieve, 50% passing No. 4, 38% passing No. 10, and 5% passing No. 200. Upon a base course ranging in thickness from 4" to 18", there were placed two 1½" layers of Asphalt Hot-Mix.

For reasons of safety, all paving was accomplished upgrade. By this method the roller, being downgrade, was never a danger to the paving operations. A problem was encountered, however, when placement of the 1½" surface course began. The newness of the 1½" binder course, plus the smoothness of the crawler tracks on the finishing machine, provided insufficient traction for the equipment to operate satisfactorily. This was due to the fact that the machine was required not only to operate up 10% grades but also to push ahead of it a heavy truck with an initial load of four tons.

To overcome this problem, ⅜" bolts were placed through the crawler tracks. Due to the weight of the finishing machine and its load, the bolts were forced into the binder course, thus preventing any track slippage. Thereafter the machine was able to negotiate the grades with ease.

At no time during the paving operations was the Drive closed to traffic and motorists were subjected to only minimum inconvenience. The Asphalt and aggregate selected have provided a smooth, even surface offering maximum resistance to skidding, and drivers are given careful instructions with regard to the handling of their cars while ascending or descending abnormal grades. The 24-foot pavement width provides an extra margin of safety, particularly on curves and hairpin turns.

The original graded Toll Road was opened to the public in 1947, leading up from U. S. Route 7, south of Manchester.

Paving with Asphalt Hot-Mix was begun in the Spring of 1953. Road remained open during working operations.

Photos: Smith Studio, Bellows Falls, Vt.

ASPHALT'S ESSENTIAL ADVANTAGES

In this cold-weather climate, where winter temperatures often drop far below zero and snow stays on the ground until well into Spring, Asphalt is not only the ideal but also the essential heavy-duty pavement type, for throughout all seasons it is highly resistant to the action of heavy frost or extreme heat and actually *improves* as traffic drives over it. Indeed, by the paving of this Drive, the first fully-paved mountain Toll Road in the United States, the advantages of Asphalt for feasibility, rapidity and economy of construction are definitely and clearly proven.

The Turner Turnpike, between Oklahoma City and Tulsa. Its wide travel lanes, flanked by adequate shoulders and raised median strip, are safely paved with skid-resistant, smooth-riding Asphalt.

Photo: Charles H. McMahon, Oklahoma City

SAFE DRIVING ON THE TURNER TURNPIKE

Oklahoma *engineered* initial safety into its Turner Turnpike and has followed up, from its opening date on May 16, 1953, with wise *education* and *enforcement* methods. Its accident record for 1953 shows fatalities at *four-tenths* of the National average for rural highways.

Through the courtesy of H. E. Bailey, General Manager of the Oklahoma Turnpike Authority, the following complete accident report has been made available. It clearly shows how carefully every detail was handled to *prevent* needless human suffering and economic loss.

TURNPIKE AUTHORITY'S REPORT

Up to January 1, 1954 there have been 72 accidents on the Turnpike. During that time 1,250,000 vehicles travelled the Turnpike for 77,000,000 vehicle miles. There have been three fatalities for an average of one fatality per 26,000,000 vehicle miles. The Oklahoma State average for all highways and streets, which is practically the same as the National average, is one fatality in 14,000,000 vehicle miles. The National average for *rural* highways is one fatality in 10,000,000 vehicle miles. All injuries have been of a minor

WELCOME to the Turner Turnpike

A FRIENDLY REMINDER

Almost all accidents on the Turnpike have been caused by the following:

1. Blowouts at high speeds.
2. Driver going to sleep.
3. Brake Failure at Toll Booths.
4. Weaving car and trailers.
5. Following too close.

A 45-mile per hour limit has been placed on cars pulling house or 4-wheel trailers. We cannot do anything about the other causes. You can. Please Co-operate.

Thank You and have a pleasant trip.

OKLAHOMA TURNPIKE AUTHORITY

nature. None of the injured have been permanently disabled, and all of them have been released from the hospital, either the day of the accident or a few days thereafter.

ACCIDENT PREVENTION

An analysis of the accidents on the Turnpike shows that the causes have been as follows:

CAUSES OF ACCIDENTS

Cause	No. of Accidents	Injuries	Fatalities
Driver fell asleep	17	14	1
Blowout	9	8	0
Accidents in Toll Booth Lanes	7	4	0
a. Following too close	3		
b. Brakes failed	3		
c. Sudden Stop	1		
Weaving House Trailer	5	3	1
Following too close	5	2	0
Parked on pavement	4	1	0
Turning across median	4	0	0
Inattention	3	1	0
Improper change of lane	3	0	0
Improper starting	2	1	0
Change of mind	2	1	0
Exceeded speed limit	3	3	1
Defective brakes	1	0	0
Passenger interference	1	3	0
Driver dizzy	1	1	0
Blinded by heavy rain	1	0	0
Driving too slow	1	1	0
Driver intoxicated	3	2	0

Although the engineered safety factor on the Turnpike is adequate in all respects, and the accident record is far better than might have been anticipated, accidents have happened, and a study of these demonstrates that they are nearly all due to driver or mechanical failure; that if Turnpike drivers would follow a few very simple safety rules, accidents could be almost entirely eliminated from the Turnpike. These rules are:

RULES FOR SAFETY

1. Do not go to sleep. Let someone else drive or pull off for a nap or a cup of coffee. Drive alertly at all times.
2. Know your tires and brakes. Unless they are all at top efficiency, drive with extreme care.
3. Drive slowly going into the Toll Booths. Check your brakes before it is too late.
4. If pulling a trailer, drive cautiously. In passing a car and trailer leave plenty of room between vehicles.
5. Leave plenty of room between you and the vehicle ahead.
6. Do not turn across the median. If you forget something, proceed to the next town to turn around. If in trouble pull off on the shoulder, wait for a Highway Patrolman or an Official Turnpike vehicle.
7. Do not park on the pavement. Use the 12-foot wide paved shoulders.
8. After stopping along the Turnpike, be sure the way is clear before starting again.
9. Stay sober.
10. Observe the minimum and maximum speed limits.
11. Proceed cautiously under rainy conditions.
12. When road conditions are icy, observe all speed limits carefully, proceed cautiously, and look out especially for icy bridges.

Although the Turnpike safety record is impressive, the Operational Management of the Oklahoma Turnpike Authority is making every possible further effort to reduce accidents. The normal speed limits range from a minimum of forty to a maximum of seventy miles per hour.

As vehicles enter the Turnpike, the driver is handed a "Welcome" card which is also a friendly reminder of the major causes of accidents and asks his cooperation. Operators of vehicles pulling house trailers are handed a red "Caution" card which advises them of the rigidly enforced 45-miles per hour speed limit for such combinations, also that the unit shall not be operated fast enough to cause weaving. Copies of these two cards are shown below.

CAUTION

SPEED LIMIT ON ALL UNITS PULLING HOUSE TRAILER OR 4-WHEEL TRAILER

45 MILES PER HOUR MAXIMUM

In no event shall the Unit be driven fast enough to cause weaving. 50% of all serious accidents on the Turnpike have been car and trailer turnovers from weaving. For your own safety, be careful. If you are not, you will endanger your own life and that of other travellers, and be subject to a $200 fine and thirty days in jail. This law will be strictly enforced.

OKLAHOMA TURNPIKE AUTHORITY

MAJOR IMPROVEMENTS on LONG ISLAND

By Herbert Spencer
District Engineer, The Asphalt Institute

Where smooth-riding, joint-free asphalt has resurfaced portland cement concrete. *Photo: Ewing Galloway*

Asphalt on the Northern State Parkway

Nearly all travelers and commuters who enter and leave New York City by automobile drive on a system of parkways known throughout the world. The Westchester County Parkways, the Taconic State Parkway fast nearing completion to Albany, the Merritt Parkway to New England, the parkways on Long Island — all are dual-lane, beautifully landscaped thoroughfares bypassing the congested local streets of a great metropolitan area.

Principally these parkways carry the great volume of through traffic traveling between New York City, nearby suburban areas, and the beach resorts on the Connecticut and Long Island shores. When completed, the Garden State Parkway will also bring the New Jersey coastal resorts within easy reach of many densely populated centers.

Perhaps the most heavily travelled of all these arteries is the Northern State Parkway on Long Island, the principal route of hundreds of thousands of motorists headed for their suburban homes, resorts, and the huge Jones Beach State Park on the south shore, visited on summer week-ends and holidays by millions of ocean bathers escaping the city heat. Traffic averages approximately 60,000 vehicles per day.

With the great increases in vehicular traffic since the end of World War II, the portland cement concrete pavement on the Northern State Parkway, completed in 1938, began to require by 1950, such extensive maintenance that a program of improvement was planned to include the widening and

At extreme left: condition of pavement prior to asphalt resurfacing.

Above: laying and spreading the asphalt surface course.

Rolling and compacting the asphalt. Traffic continues on the lane at left, still to be resurfaced.

Photos: Spencer

resurfacing with asphalt of a 6½-mile section extending east from the New York City line.

In addition to the worn condition of the pavement, the parkway lanes, up to 1950, had been narrow and no median strip existed. There was also no space along the highway strips to park disabled cars, congestion was constant and the number of accidents high. Initial operations, which involved installation of a median strip and improvement of access roads, were completed in 1951.

In the summer of 1952 widening and resurfacing operations were begun. Widths of approximately 3½ feet were added to each side of the pavement, thus providing the four lanes with a total width of 25 to 35 feet on either side of the median. Conforming to New York State specifications, the entire surface was then covered with 2½" of Asphalt Hot-Mix laid in two courses of 1½" and 1", respectively.

The extremely heavy travel on this route necessitated very careful planning as to the handling of traffic during working hours. During 1953 work was continued both day and night, with at least one eastbound and one westbound lane kept open between 9:00 A.M. and 4:00 P.M. on week-days. On Saturdays, Sundays and holidays two lanes remained open in both directions, keeping congestion at a minimum.

With these improvements, completed in 1953, this section of the Northern State Parkway has become not only a safer road but also has acquired, through resurfacing with asphalt, a much stronger, heavy-duty pavement whose smooth-riding qualities have received much favorable comment from the traveling public. New ten-foot-wide level grass shoulders, incorporated in the work, have provided motorists with emergency parking spaces and also improved the general appearance of this beautiful parkway.

Asphalt on the Sunrise Highway

The Sunrise Highway was so named because it runs eastward out of New York City on Long Island toward the rising sun. As it passes through Nassau County it connects many rapidly growing suburban towns and also, serving as an arterial route, carries a major proportion of all through heavy-duty trucks. As the Long Island Parkways permit no commercial traffic and the Long Island Railroad handles little freight, there is intense concentration on this six-lane divided highway, traffic counts now showing over 33,000 vehicles per day. A major resurfacing improvement project, placing asphalt in two courses over the worn Portland Cement Concrete pavement is now partially completed, extending from Valley Stream through Lynbrook and Rockville Centre, with plans to continue the modernization eastward to Suffolk County as state funds permit.

The view at right of the Sunrise Highway as it passes through Lynbrook shows in the foreground a finishing machine and a roller laying the Asphalt binder course on the south lanes in resurfacing the Portland Cement Concrete. New paving, consisting of a minimum of 2½" of asphalt plant-mix in two courses was completed in July 1953, with two-way traffic maintained at all times while the work was in progress.

Asphalt resurfacing over portland cement concrete on the Sunrise Highway at Lynbrook, Long Island.

Photo: Platnick

RAYMOND HARSCH

Chairman of the Executive Committee of The Asphalt Institute

Raymond Harsch is serving as Chairman of the Executive Committee of The Asphalt Institute for 1954. This committee is the planning and governing body of the Institute under the direction of its Board of Directors. Mr. Harsch, Manager of the Asphalt Department of Shell Oil Company, San Francisco, joined that company in 1930 following a long career in the road-paving field as Materials Engineer with the Federal Bureau of Public Roads, as Testing Engineer and Instructor at the University of Idaho, and as Materials Engineer with the Idaho Bureau of Highways. He holds memberships in the American Society for Testing Materials, the Association of Asphalt Paving Technologists and has served for many years on the Technical and Management Committees of The Asphalt Institute.

Asphalt – An Indispensable Construction Material

By Raymond Harsch

Asphalt, a durable product, falls into a different category from most other petroleum derivatives. Unlike its related products — gasoline, Diesel fuel and lubricants, which are destroyed in use — asphalt functions as a waterproofing and cementing medium where durability and long life are essential characteristics. In fact, without asphalt the need for these other petroleum products would be greatly curtailed, as approximately 85% of the paved highway and airport surfaces, on which vehicles using these fuels operate, are of asphaltic types. Furthermore, practically 100% of the maintenance, resurfacing and salvaging of existing pavements of all types is accomplished with asphalt.

Of all the asphalt produced in this country, over 75% is used in the paving of roads, streets and airports. Manufacturing and industrial requirements account for nearly 25% of the estimated 15 million tons of asphalt marketed annually in the United States, with the major portion of this latter percentage used in the production of roofing and other waterproofing materials for home and building construction. Adding up its outstanding advantages — its extreme versatility, its variety of uses and its economical availability to the user — asphalt is proving to be truly an indispensable product today.

The asphalt industry appreciates and accepts its responsibility not only to continue to supply asphalt in the quantities required but also, through The Asphalt Institute, to develop new uses, improve product quality and application methods, and to provide engineering assistance, educational programs, and suitable literature to further the proper use of this important construction material.

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